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1- Opening and Closing Procedures



WARNING

Before starting any procedure, review the safety information provided in the Gendex expert® DC User Manual.

Master Control

Opening the Master Control

Tools Required:	No. 2 Phillips Screwdriver
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There are 2 configurations for the Master Control:

- Local - Master Control Touch Panel is mounted directly to the Master Control
 - Remote - Master Control Touch Panel is mounted on a wall plate
1. Turn OFF the power switch.
 2. Disconnect the external power source:
 - FOR A SYSTEM WITH A LINE CORD (120 V ac only), unplug the line cord.
 - FOR A HARD-WIRED SYSTEM, disconnect the mains supply (external power source) and use a meter to verify the mains supply is disconnected.
 3. For **Local configurations**, continue with **Local Configuration Instructions**.

For **Remote configurations**, continue with **Remote Configuration Instructions** on page 1-6.

Local Configuration Instructions

To open the Master Control when the Master Control Touch Panel is mounted directly, (Local configuration):

1. Remove the Master Control Touch Panel:

(Continued)

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- a. Pull out at the top of the Master Control Touch Panel.



Figure 1-1 Removing the Master Control Touch Panel

- b. Disconnect the control cable and the exposure switch coil-cord or wall switch cord.



Figure 1-2 Disconnecting the Cable and Cord

- c. Lay the Master Control Touch Panel aside. This will be re-installed later.
2. Position the horizontal arm so that it is parallel to the wall.

(Continued)

(Continued)

3. Remove the small top cover by pulling up at the corner.



Figure 1-3 Removing the Top Cover

4. Grip the outer cover at the top and at the bottom rear hand-grip cutout and carefully pull it off.



Figure 1-4 Removing the Outer Cover

5. Pull the control cable and the coil-cord back through the cutout for the cables while removing the outer cover.
6. Lay the covers aside for later re-installation.

(Continued)

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7. Unscrew the Strain Relief to remove the control cable and coil-cord from the door.



Figure 1-5 Removing the Control Cable and Coil-Cord

8. Remove the two Phillips head screws and open the door carefully.

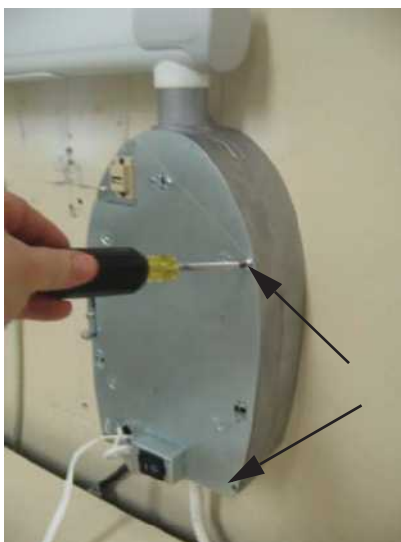


Figure 1-6 Opening the Door

Remote Configuration Instructions

To open the Master Control in systems with the Master Control Touch Panel mounted on a wall plate (Remote configuration):

1. Pull out at the top of the blank panel.



Figure 1-7 Removing the Blank Touch Panel

2. Lay the blank panel aside. This will be reinstalled later.
3. Position the Horizontal Arm so that it is parallel to the wall.
4. Remove the small top cover by pulling up at the corner, and lay the cover aside; this will be reinstalled later.



Figure 1-8 Removing the Top Cover

(Continued)

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5. Grip the outer cover at the top and at the bottom rear hand-grip cutout and carefully pull it off.



Figure 1-9 Removing the Outer Cover

6. Lay the covers aside to be re-installed later.
7. Remove the two Phillips head screws and open the door carefully.

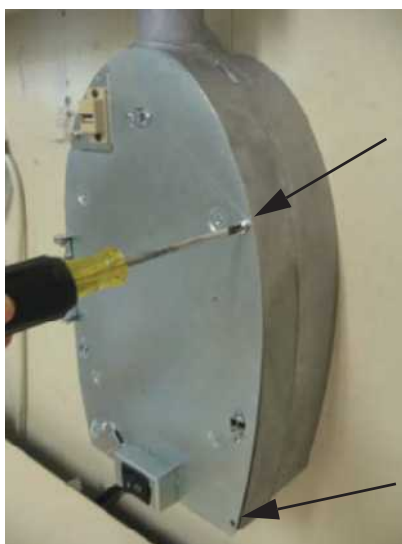


Figure 1-10 Opening the Door

Closing the Master Control

Tools Required:	No. 2 Phillips Screwdriver
-----------------	----------------------------

1. Close the door and reinstall the two Phillips screws.
2. Reinstall the outer cover and the top cover.
3. For **Local configurations**, continue to step 4.

For **Remote configurations**, skip to step 5.

4. For the Master Control Touch Panel that is mounted directly to the Master Control:
 - a. Put the cables back in the Strain Relief.
 - b. Pull the control cable and the coil-cord back through the cutout for the cables when reinstalling the outer cover.
 - c. Connect the control cable and the exposure switch coil-cord to the Master Control Touch Panel before attaching the panel to the outer cover.
 - d. Skip to step 6.
5. Install the Blank Plate in the outer cover.
6. Make sure all parts and screws are back on.
7. Restore power to the equipment:
 - FOR A SYSTEM WITH A LINE CORD (120 V ac only), plug in the line cord.
 - FOR A HARD-WIRED SYSTEM, reconnect the mains supply (external power source) and use a meter to verify the mains supply is connected properly.
8. Turn ON the power switch.

Articulated Arm

Opening an End of the Articulated Arm

1. Turn OFF the power switch.
2. Disconnect the external power source:
 - FOR A SYSTEM WITH A LINE CORD (120 V ac only), unplug the line cord.
 - FOR A HARD-WIRED SYSTEM, disconnect the mains supply (external power source) and use a meter to verify the mains supply is disconnected.



CAUTION

There are three pins inserted into posts that hold the two sections of the Trim Cover together. Do not use excessive force when separating the two sections as the pins can be broken. If it is necessary to use a small screwdriver to separate the two sections, position the screwdriver at the location of the pins as shown in Figure 1-11.

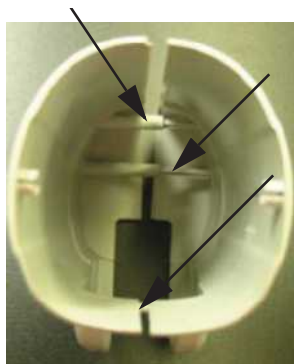


Figure 1-11 Locating the Three Pins Inside the Articulated Arm Trim Covers

(Continued)

Closing an End of the Articulated Arm

(Continued)

3. Separate and remove the plastic Trim Covers from the end of the section of the Articulated Arm. Set the Trim covers aside.

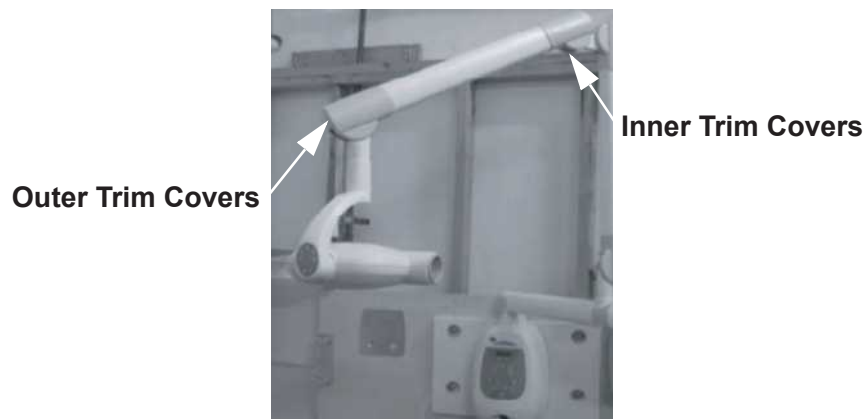


Figure 1-12 Articulated Arm Trim Covers

Closing an End of the Articulated Arm

1. Place the two sections at the end of the Articulated Arm, one on each side. Press the two sections together ensuring that the pins of the one section are aligned correctly inside the posts of the other section.
2. Restore power to the equipment:
 - FOR A SYSTEM WITH A LINE CORD (120 V ac only), plug in the line cord.
 - FOR A HARD-WIRED SYSTEM, reconnect the mains supply (external power source) and use a meter to verify the mains supply is connected properly.
3. Turn ON the power switch

2- Checks

To prevent unnecessary problems in the future, perform the following set of checks as part of the recommended maintenance as indicated in the User Manual.



WARNING

Failure to perform these checks may result in a system that fails to comply with U.S. Radiation Performance Standards 21 CFR Subchapter J.



CAUTION

**To avoid any potential hazard to operators or patients, any unusual operation, problems with mechanical functions, or presence of debris, should be reported to Gendex immediately.
If problems persist, advise the owner NOT TO USE THE SYSTEM.**

System Functions



WARNING

Before starting any procedure, review the safety information provided in the Gendex expert[®] DC User Manual.

If problems are found, refer to the appropriate section in this Service Manual for:

- Adjustment procedures for the Horizontal Arm, Articulated Arm, and Tubehead (page 3-1)
- Maintenance procedure for the Articulated Arm (page 3-11)
- Troubleshooting information (page 5-1)
- Electrical block diagrams (page 5-20).

IMPORTANT! Contact GENDEX Technical Support if additional information is required.

- _____ 1. **Tubehead** - Check for oil leaks or other evidence that could indicate internal damage. Replace the Tubehead if necessary.
- _____ 2. **Tubehead Rotation** - Ensure that the Tubehead maintains its position around the horizontal axis while remaining easy to rotate and position. For horizontal dropping, refer to page 3-2 for the procedure.

Also check for unwanted pivoting of the Tubehead around the vertical axis. Problems with vertical pivot are typically caused when the Horizontal Arm is not properly leveled although the problem can simply be caused when the cabling inside the Tubehead Yoke is too tight.

- _____ 3. **Mounting** - Be sure that the wall support is adequate and that the system is properly mounted to the wall.
- _____ 4. **Power Switch** - Verify that the switch is working properly and that the Ready Indicator Lamp is illuminated when the power switch is in the ON position.

(Continued)

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- ____ 5. **Master Controls** - With the power switch in the ON position, verify that a Time Selection value indicates on the Master Control Touch Panel display.

Also check the function of the selector switches for the Anatomical Time Selection, Imaging Type Selection and Patient Selection. Pressing the selection buttons should cause indicator lamps to indicate the selected item.

- ____ 6. **Quickset Tubehead Control** - Verify that the indicator lamps are consistent with the Master Control selections. Verify that the selector button works properly.
- ____ 7. **Push-button exposure switch** - Verify that the push-button switch in the face of the operator controls is functioning properly.
- ____ 8. **Coil-cord exposure switch** - If the coil-cord switch is used, inspect the switch housing and coiled cord for damage or wear. Replace if there is evidence of damage present.
- ____ 9. **Exposure Indicators** - Make several exposures and verify that the Radiation Indicator Lamp illuminates and the audible signal is heard.
- ____ 10. **Premature Termination** - Select an exposure of 2 seconds using the manual adjustment buttons. Initiate an exposure, but release the exposure switch after a brief period of time before the timer terminates the exposure. Verify that exposure terminates immediately upon release of the exposure switch.
- ____ 11. **X-ray Beam Size** - Position the cone of the Tubehead directly onto a panoramic film or several occlusal films taped together to form a large rectangle. Process the film and verify that the resulting image is containable in a 6 cm circle.
- ____ 12. Check that the arms are evenly balanced and that all movements are smooth and quiet. Verify that the Horizontal and Articulated Arms do not drift.

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3- Adjustments and Maintenance

Procedures include adjustments for the:

- Tubehead (page 3-2)
- Horizontal Arm (page 3-2)
- Articulated Arm (page 3-5)

Procedures include maintenance for the Articulated Arm (page 3-11).

Preliminary Information

The balance of the Articulated Arm is initially set at the factory. Other friction and drift adjustments are set during the installation process.

Adjustments provided in this document are to accommodate customer preferences or changes in the leveling of the system due to age.

Note! The mechanical adjustments should not be used to compensate for a system that is not properly leveled on the wall.

Before making any adjustments, first verify that the unit is properly leveled on the wall; then make adjustments as necessary.



WARNING

Before starting any procedure, review the safety information provided in the Gendex expert® DC User Manual.

Adjustments

Tubehead - Horizontal Drifting

The Tubehead will drift from the correct horizontal position if the four hex locking nuts are not adjusted properly. This can happen when the supplied 8" (20 cm) cone is replaced with the longer, heavier 12" (30 cm) cone.

Note! The adjustment of the four hex locking nuts does not lock the Tubehead in place but provides proper friction to allow the Tubehead to be rotated and then to remain in the position to which it has been rotated.

Tools Required:	2.5 mm Allen Wrench 4.5 mm Hex Wrench
-----------------	--

1. Turn OFF the power switch.
2. Disconnect the external power source:
 - FOR A SYSTEM WITH A LINE CORD (120 V ac only), unplug the line cord.
 - FOR A HARD-WIRED SYSTEM, disconnect the mains supply (external power source) and use a meter to verify the mains supply is disconnected.
3. Unscrew the two screws on the Tubehead Yoke Cover Plate, using a 2.5 mm Allen wrench and remove the cover plate from the underside of the Tubehead yoke. (It may be necessary to position a thin screwdriver at the base and gently pry off the cover.)



Figure 3-1 Removing the Tubehead Yoke Cover Plate

(Continued)

(Continued)

4. Tighten the locking nuts:
 - a. Rotate the Tubehead to its maximum position (until it stops).
 - b. Locate the first hex locking nut, and tighten it with the 4.5 mm hex wrench.

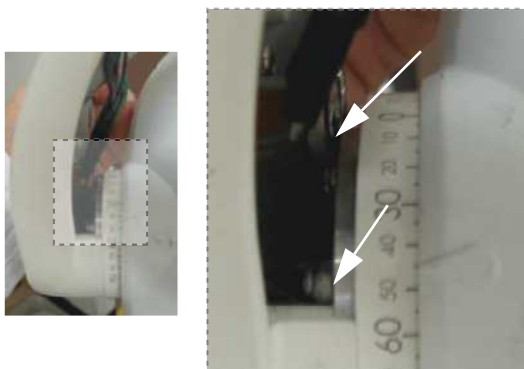


Figure 3-2 Two of the Four Hex Locking Nuts

- c. Rotate the Tubehead until you see the next hex locking nut. Tighten the nut.
 - d. Repeat step c. for the remaining two hex nuts.

Note! Tighten all four hex nuts equally, to apply adequate friction to prevent drifting.

5. Reposition the cover plate and snap it into place. Screw in the two screws that secure the cover plate.
6. Restore power to the equipment:
 - FOR A SYSTEM WITH A LINE CORD (120 V ac only), plug in the line cord.
 - FOR A HARD-WIRED SYSTEM, reconnect the mains supply (external power source) and use a meter to verify the mains supply is connected properly.
7. Turn ON the power switch.

Horizontal Arm - Horizontal Drifting

Horizontal Arm - Horizontal Drifting

Tools Required:	4 mm Allen Wrench
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WARNING

Ensure that you follow the procedure referenced in the following step. This equipment must always be electrically disconnected from the mains electrical supply (external power source) before beginning any procedure.

1. Follow the steps outlined in *Opening the Master Control*, page 1-2 to page 1-7, to open the Master Control.
2. Locate the Horizontal Pivot Brake (the bar clamped around the Horizontal Arm pivot post). There are two screws on either side of the brake.
3. Using a 4 mm Allen wrench, tighten the two screws equally to apply adequate braking to the pivot post to prevent drifting.

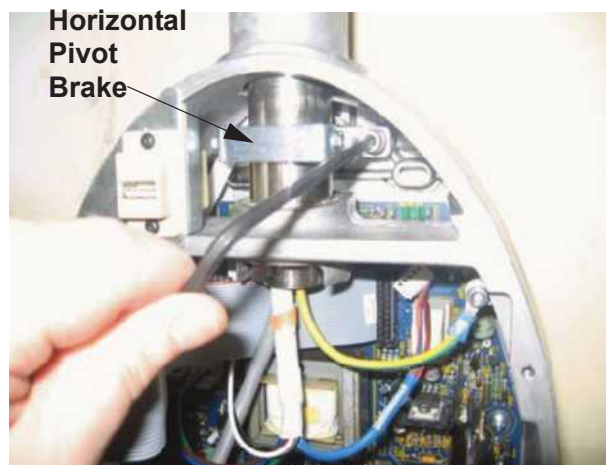


Figure 3-3 Tightening the Pivot Brake Screws

4. Follow the steps outlined in *Closing the Master Control* on page 1-8 to close the Master Control.

Articulated Arm - Horizontal Drifting

Tools Required:	4 mm Allen Wrench
-----------------	-------------------

1. Turn OFF the power switch.
2. Disconnect the external power source:
 - FOR A SYSTEM WITH A LINE CORD (120 V ac only), unplug the line cord.
 - FOR A HARD-WIRED SYSTEM, disconnect the mains supply (external power source), and use a meter to verify the mains supply is disconnected.
3. Slide off the end cap cover from the end of the Horizontal Arm.



Figure 3-4 Removing the End Cap Cover

(Continued)

Articulated Arm - Horizontal Drifting

(Continued)

4. Locate the Friction screw. Using a 4 mm Allen wrench, tighten or loosen as necessary to get the proper amount of friction or drag to prevent horizontal drifting.

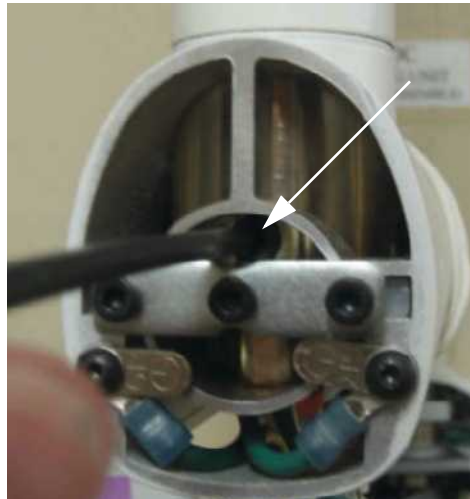


Figure 3-5 Adjusting the Friction Screw

5. Install the end cap cover.
6. Restore power to the equipment:
 - FOR A SYSTEM WITH A LINE CORD (120 V ac only), plug in the line cord.
 - FOR A HARD-WIRED SYSTEM, reconnect the mains supply (external power source), and use a meter to verify the mains supply is connected properly.
7. Turn ON the power switch.

Articulated Arm - Vertical Drifting

Outer Section

Figure 3-6 shows the location referred to as the outer section of the Articulated Arm (the section nearest the Tubehead).



Figure 3-6 Locating the Outer Section of the Articulated Arm

Tools Required:	7 ½" (190 mm) long 5/16" (8 mm) Allen Wrench - or - 8" (203 mm) long 8 mm T-handle Allen Wrench Small Flat Head Screwdriver
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WARNING

Ensure that you follow the procedure referenced in the following step. This equipment must always be electrically disconnected from the mains electrical supply (external power source) before beginning any procedure.

(Continued)

Articulated Arm - Vertical Drifting

(Continued)

1. Follow the steps outlined in *Opening an End of the Articulated Arm* on page 1-9 to remove the trim cover from the end of the outer section of the Articulated arm.
2. Drop the outside section of the arm to a position to easily access the adjustment nut (approximately 30° off of horizontal).

Note! For the following step, a minimum 7 ½" (190 mm) long Allen wrench is required. A T-handled Allen wrench is recommended. If a standard Allen wrench is used, additional leverage may be needed to turn the nut.

3. Insert an 8 mm Allen wrench about 8 inches long through the hole at the end of the arm and into the adjustment nut.



Figure 3-7 Adjusting the Vertical Drifting

4. If the arm section is drifting either up or down, rotate the adjustment nut in the needed direction until the drifting stops:
 - Rotate clockwise to increase the upward force on the arm.
 - Rotate counterclockwise to decrease the upward force on the arm.

Note! If you need to turn the screw more than three times, contact Gendex Technical Support.

Note! You can not unscrew the adjustment nut completely.

5. Continue turning the nut in the same direction counting the turns until the arm starts to move in the opposite direction. Then turn the adjustment nut the opposite direction ½ the number of turns counted.
6. Follow the steps outlined in *Closing an End of the Articulated Arm* on page 1-10 to install the trim cover and restore power.

Inner Section

The inner section of the Articulated Arm is the section nearest the fork of the Tubehead.



Figure 3-8 Locating the Inner Section of the Articulated Arm

Tools Required	7 1/2" (190 mm) long 5/16" (8 mm) Allen Wrench - or - 8" (203 mm) long 8 mm T-handle Allen Wrench Small Flat Head Screwdriver
----------------	--



WARNING

Ensure that you follow the procedure referenced in the following step. This equipment must always be electrically disconnected from the mains electrical supply (external power source) before beginning any procedure.

1. Follow the steps outlined in *Opening an End of the Articulated Arm* on page 1-9 to remove the trim cover from the end of the inner section of the Articulated arm.
2. Position the inside section of the Articulated Arm at approximately a 45° angle to the Horizontal Arm.
The angle of the arm allows access to the adjusting nut (see Figure 3-9).

(Continued)

Articulated Arm - Vertical Drifting

(Continued)

Note! For the following step, a minimum 7 ½" (190 mm) long wrench is required. A T-handled wrench is recommended. If a standard Allen wrench is used, additional leverage may be needed to turn the nut.

3. Insert an 5/16" (8 mm) Allen wrench through the hole at the end of the arm and insert into the adjustment nut.



Figure 3-9 Inserting the Wrench

4. If the arm section is drifting either up or down, rotate the adjustment nut in the needed direction until the drifting stops:
 - Rotate clockwise to increase the upward force on the arm.
 - Rotate counterclockwise to decrease the upward force on the arm.
5. Continue turning the nut in the same direction, counting the turns, until the arm starts to move in the opposite direction. Then turn the adjustment nut the opposite direction ½ the number of turns counted.
6. Follow the steps outlined in *Closing an End of the Articulated Arm* on page 1-10 to install the trim cover and restore power.

Maintenance

Articulated Arm - Inspection

To ensure smooth functioning of the Gendex expert® DC Articulated Arm, the following procedure must be performed periodically.

Tools Required	Small flat-head screwdriver
Supplies Required	"Tri-Gel" lubricant (Gendex part number 1603-0001)

Note! To avoid any potential hazard to operators or patients, any unusual operation, problems with mechanical functions, or presence of debris should be reported to Gendex immediately.



WARNING

Ensure that you follow the procedure referenced in the following step. This equipment must always be electrically disconnected from the mains electrical supply (external power source) before beginning any procedure.

1. Follow the steps outlined in *Opening an End of the Articulated Arm* on page 1-9 to remove all four trim covers from the ends of the Articulated Arm.
2. Inspect the insides of each cover for debris. Remove and clean as necessary.
3. At each pantograph link (all four), inspect the pins retaining the pantograph link as indicated in Figure 3-10.



(The illustration does not show the matching pin on the opposite side of the

Figure 3-10 Locating the Pins for Inspection

(Continued)

Articulated Arm - Inspection

(Continued)



CAUTION

The pins referred to in the following step should never be adjusted in the field. This information is given to determine if you need to contact Gendex Technical Support.

4. Ensure that the pins are fully inserted into the casting, and the pantograph links are seated on the shoulder of the pin. If the pins have moved outward more than 0.015" (0.38 mm or the thickness of a business card), contact Gendex Technical Support.

Note! The pins are held in with sealed set screws-NEVER REMOVE THE SEALANT-this may void the warranty.

5. If the arm is squeaking, lubricate the shoulder of the pins where they meet the pantograph link with "Tri-Gel" lubricant (Gendex part number 1603-0001).
6. Exercise the arm for several cycles.
7. Check the arm for balance and smooth operation. If drifting is observed, follow the adjustment procedure that corresponds to the type of drifting.
8. Follow the steps outlined in *Closing an End of the Articulated Arm* on page 1-10 to install the trim covers and then restore power.

4- Configuration Settings

This chapter describes the procedures to properly set the SW2 switch and the AC Input Select Jumper.



WARNING

Before starting any procedure, review the safety information provided in the Gendex expert[®] DC User Manual.

SW2 - Setting for X-Ray Output

Switch Settings

SW2 - Setting for X-Ray Output

Normally the dip switch setting for x-ray output, SW2 position 4, should not be changed. If for some reason the setting has been changed, the x-ray output will be disabled. All other functions will appear normal.

Note! It is recommended that this procedure be performed only by a qualified Gendex service agent.



WARNING

Ensure that you follow the procedure referenced in the following step. This equipment must always be electrically disconnected from the mains electrical supply (external power source) before beginning any procedure.

1. Follow the steps outlined in *Opening the Master Control*, beginning on page 1-2, to open the Master Control.
2. Locate the series of dip switches labeled SW2 located at the bottom left of the Logic Board.
3. Set the position 4 switch to the OFF position. All other switches should remain in the OFF position.

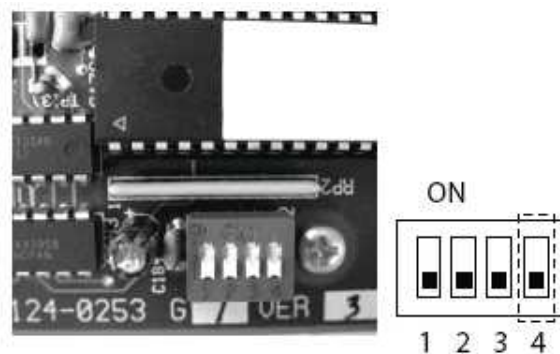


Figure 4-1 Setting the SW2 Dip Switch

4. Follow the steps outlined in *Closing the Master Control* on page 1-8 to close the Master Control.

SW2 - Setting for Optional 12" (30 cm) Cone

The default settings for anatomical exposure times are set at the factory for an 8" (20 cm) focal length cone. The 12" (30 cm) cone is recommended when using the paralleling film positioning technique. Using the longer cone requires the use of longer exposure times. These exposure times can be programmed into the system by changing the setting on Switch SW2.

Note! It is recommended that this procedure be performed only by a qualified Gendex service agent.

1. Turn the system on and note the initial displayed exposure time.



WARNING

Ensure that you follow the procedure referenced in the following step. This equipment must always be electrically disconnected from the mains electrical supply (external power source) before beginning any procedure.

2. Follow the steps outlined in *Opening the Master Control*, starting on page 1-2, to open the Master Control.
3. Locate the series of dip switches labeled SW2 located at the bottom left of the Logic Board.
4. Set the position 3 switch to ON position.

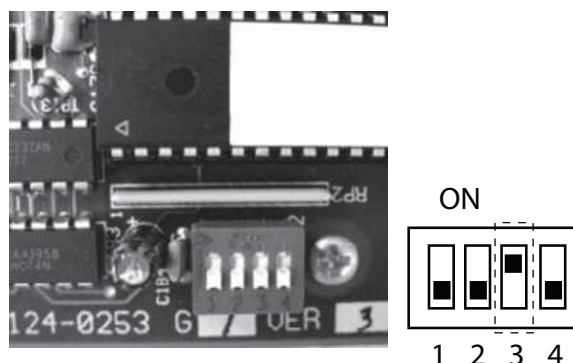


Figure 4-2 Setting the SW2 with Optional Cone Dip Switch

5. Follow the steps outlined in *Closing the Master Control* on page 1-8 to close the Master Control.
6. The initially displayed exposure time should now be two times the time displayed in step 1.

JP1 - Setting for 120 V ac

Jumper Settings

JP1 - Setting for 120 V ac

Note! The unit is shipped with the jumper configured for 220 V ac. Systems using 120 V ac with the line cord option requires moving the “AC Input Select” jumper from the 220 V setting to the 120 V setting, and cutting the JP1 jumper to enable the neutral line fuse.



WARNING

Ensure that you follow the procedure referenced in the following step. This equipment must always be electrically disconnected from the mains electrical supply (external power source) before beginning any procedure.

1. Follow the steps outlined in *Opening the Master Control*, starting on page 1-2 to open the Master Control.
2. Locate the AC Input Select jumper.
3. Unplug the jumper from the 230 V ac and plug it into the 120 V ac setting

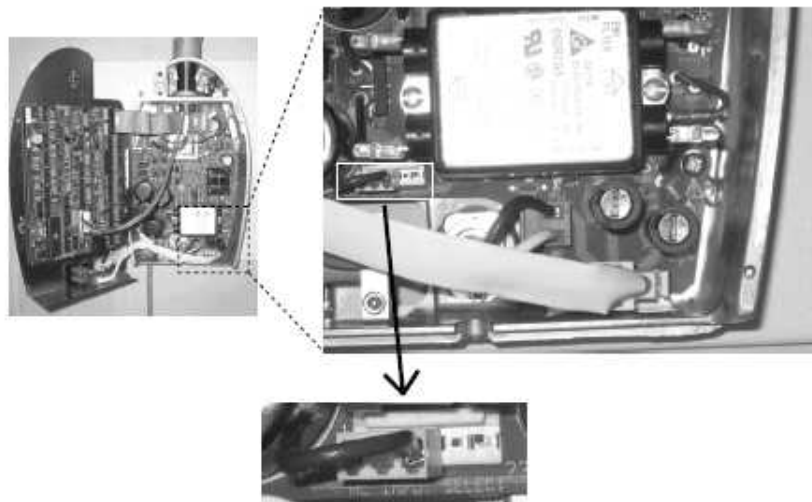


Figure 4-3 Locating the AC Input Select Jumper

(Continued)

(Continued)

4. To enable the neutral line fuse, cut jumper JP1 on the Converter Board (124-0292G1), as shown in Figure 4-4.
5. Follow the steps outlined in *Closing the Master Control* on page 1-8 to close the Master Control

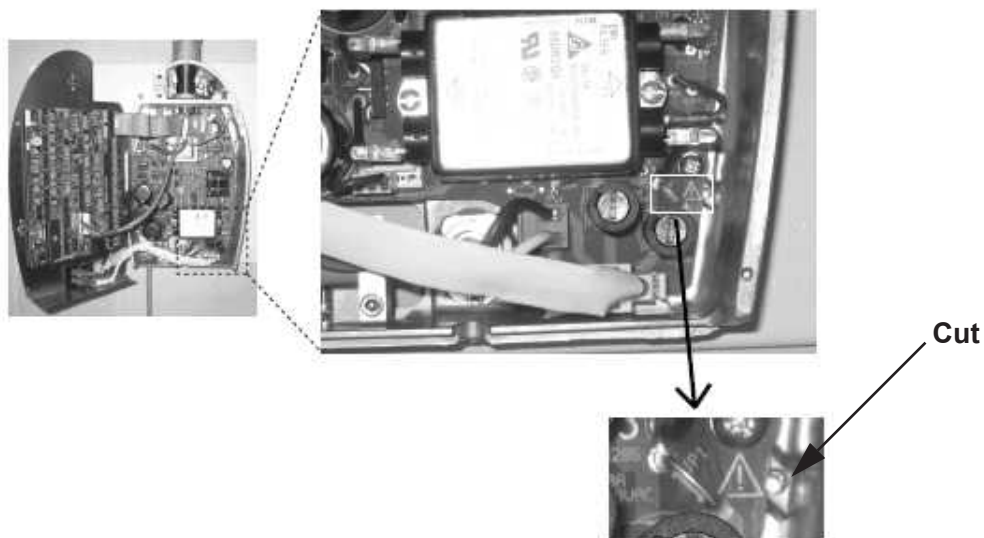


Figure 4-4 Cutting Jumper JP1

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5- Problem Resolution



WARNING

Before starting any procedure, review the safety information provided in the Gendex expert® DC User Manual.

Follow these steps before contacting Gendex for additional support.

1. Verify all electrical connections, including the plug connections between the Articulated Arm and the Horizontal Arm, are good.

Note! Poor connections can occur when dressing the cables up into the Horizontal Arm.

2. Verify the assembly of the equipment is correct.
3. Review the information in this chapter:
 - Common symptoms and possible remedies. See page 5-1.
 - For the Converter Board:
 - Location and description for LEDs. See page 5-8.
 - Location and description for test points. See page 5-10.
 - Descriptions of connectors and jumpers. See page 5-12.
 - For the Logic Board:
 - Location and description for LEDs. See page 5-14.
 - Location and description for test points. See page 5-16.
 - Descriptions of connectors and jumpers. See page 5-18.
 - Electrical block diagram. See page 5-20.

(Continued)

(Continued)

Table 5-1 Common Symptoms and Possible Remedies

Symptom	Additional Symptoms	Possible Cause	Remedy
No x-ray output	All other functions appear normal.	SW2 -4 set incorrectly	Set SW2-4 from the ON position to the OFF position
No time display		Mains voltage missing; power switch OFF or pluggable terminal strip not connected	If wiring difficulty is not easily discerned, have a qualified electrician check the power line
		F5-F6 fuse blown	Contact GENDEX Technical Support for further assistance
		F1 fuse blown	Contact GENDEX Technical Support for further assistance
Display flashes "Err0" and the Ready light is OFF		Premature release of the exposure switch	Pressing any key but the exposure switch on the Master Control Touch Panel will clear the display. Be sure to press and hold the exposure button until the exposure is finished
	Operation may be normal most of the time, with fault appearing intermittently	Faulty exposure switch or wiring	Verify and correct wiring as necessary, or replace the exposure switch

(Table continued on the next page)

Table 5-1 Common Symptoms and Possible Remedies (Continued)

Symptom	Additional Symptoms	Possible Cause	Remedy
Display flashes "Err1" and the Ready light is OFF	Ready light is OFF, other display functions appear normal	Mains voltage configuration jumper improperly positioned	Re-configure the jumper per the instructions on page 4-5
		Mains voltage out of range 108 V - 132 V or 198 V - 253 V	Wait until the line voltage returns to normal (indicated by the lamp being steady) or have a qualified electrician check the power line
Display flashes "Err2" and the Ready light is OFF	Ready light is OFF; exposure terminates normally, but the output may be below normal	Mains voltage drops below minimum required during exposure, or source resistance may be too high	Pressing any key except the exposure switch on the Master Control Touch Panel will clear the display. If the problem persists, have a qualified electrician check the power line
No exposure with the remote exposure switch		Wrong remote cable selected from the D800 HK kit	Verify and correct the wiring as necessary.
		Faulty handswitch or wiring	
		Mis-wired 110-0160G1 remote cable adapter kit --customer-supplied wiring problems	
Cooling light is ON	Normal operation by design -- protects and extends the life of the tubehead if too many exposures are made in too short a period of time	X-ray unit is in the cooling mode	Wait until the lamp goes out, indicating that the tube has properly cooled down.

(Table continued on the next page)

Table 5-1 Common Symptoms and Possible Remedies (Continued)

Symptom	Additional Symptoms	Possible Cause	Remedy
Display flashes "Err3" and the Ready light is OFF	Operation may appear normal for several minutes, or until an exposure is attempted	P6 feedback plug open circuit	Verify and correct the wire termination to the plug as necessary.
		Horizontal Arm J20 misconnected	Ensure that the arm connections are securely made, and that the connectors are neatly dressed into the Horizontal Arm, with no undue stress being exerted on the wiring.
Display flashes "Err4" and the Ready light is OFF		P5 filament drive plug offset by 1 pin	Pressing any key except the exposure switch on the Master Control Touch Panel will clear the flashing. Verify and correct plug connections as necessary.
		P6 filament feedback plug offset by 1 pin.	
		Horizontal Arm J16 misconnected	Pressing any key except the exposure switch on the Master Control Touch Panel will clear the flashing. Ensure that the arm connections are securely made, and that connectors are neatly dressed into the Horizontal Arm, with no undue stress being exerted on the wiring.

(Table continued on the next page)

Table 5-1 Common Symptoms and
Possible Remedies (Continued)

Symptom	Additional Symptoms	Possible Cause	Remedy
Display flashes "Err4" and the Ready light is OFF (Continued)		Floating main earth ground	Pressing any key except the exposure switch on the Master Control Touch Panel will clear the flashing. If the wiring difficulty is not easily discerned, have a qualified electrician check the power line.
	Intermittent operation	Intermittent interconnecting wire in the arm	Pressing any key except the exposure switch on the Master Control Touch Panel will clear the flashing. Bad connector terminal crimp, loose connector terminal, or a broken cable wire; contact GENDEX Technical Support for further assistance.
	Symptom may be intermittent	Preheat pot misadjusted	Pressing any key except the exposure switch on the Master Control Touch Panel will clear the flashing. Follow the filament preheat reset procedure provided with the replacement tubhead.

(Table continued on the next page)

Table 5-1 Common Symptoms and
Possible Remedies (Continued)

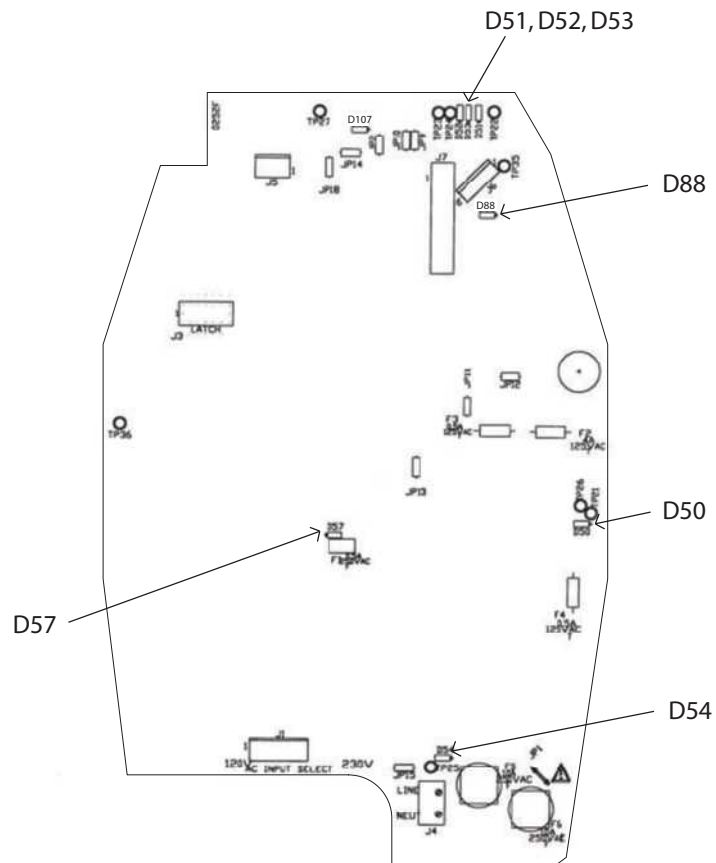
Symptom	Additional Symptoms	Possible Cause	Remedy
Display flashes "Err4" and the Ready light is OFF (Continued)	Symptom may appear only on the first few exposures of the day	The Tubehead is arcing internally	Pressing any key except the exposure switch on the Master Control Touch Panel will clear the flashing. Contact GENDEX Technical Support for further assistance.
Display on the Quickset Tubehead Control is not lit		Time selected does not conform to a default patient setting	Normal operation -- display will come back on when the time up or down arrows are pushed to select a time that corresponds to a default patient setting.
		P9 Quickset Tubehead Control plug is offset	Verify and correct the plug connections as necessary.
Display on the Quickset Tubehead Control is not correct	Time display reads "0001" -- no decimal point	P9 Quickset Tubehead Control plug is reversed	Verify and correct the plug connections as necessary.

(Table continued on the next page)

Table 5-1 Common Symptoms and
Possible Remedies (Continued)

Symptom	Additional Symptoms	Possible Cause	Remedy
Display on the Quickset Tubehead Control is not lit correctly	Individual lights may or may not be working properly	Horizontal Arm J17 is misconnected	Ensure that the arm connections are securely made, and that the connectors are neatly dressed into the Horizontal Arm, with no undue stress being exerted on the wiring.
		Horizontal Arm J21 is misconnected	Ensure that the arm connections are securely made, and that the connectors are neatly dressed into the Horizontal Arm, with no undue stress being exerted on the wiring.

Converter Board - LEDs



(Continued)

5-8

032-0207-EN Rev 0

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(Continued)

Table 5-2 Converter Board LEDs Description

LED Number	Color	Normal State	Explanation
D50	Green	On	P15 V isolated Output voltage is present
D51	Green	On	-15 V output voltage is present
D52	Green	On	15 V output voltage is present
D53	Green	On	5 V output voltage is present
D54	Green	On	P15 output voltage is present
D57	Green	On	325 V dc bus voltage is present
D88	Green	On	Filament output voltage is present Note!: This LED is only fully illuminated during exposure

Converter Board - Test Points

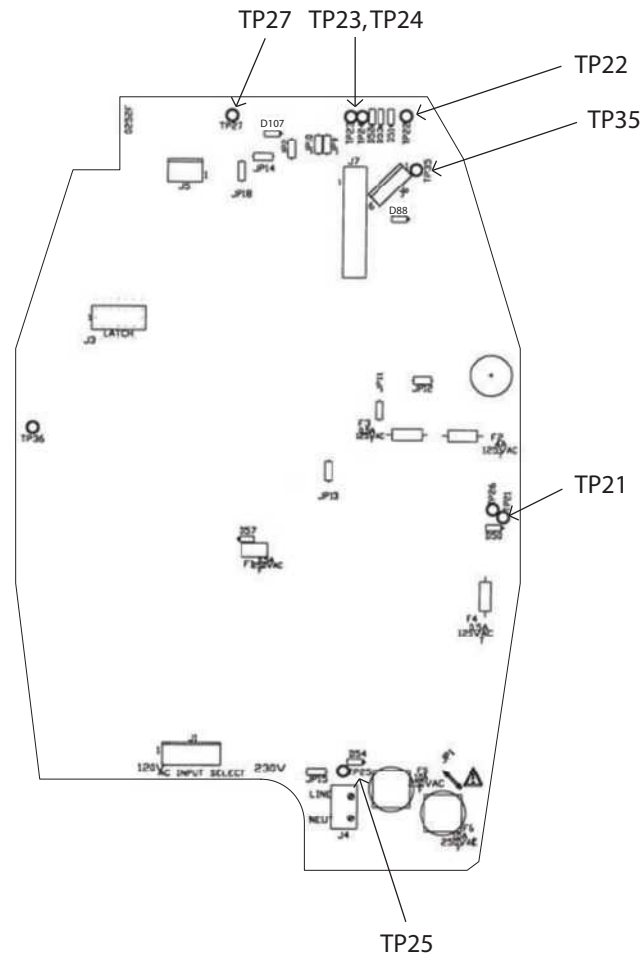


Figure 5-2 Location of Converter Board Test Points

(Continued)

(Continued)

Table 5-3 Convert Board Test Points Description

Test Point	Return	Description	Type	Nom. Value	Notes
TP21	TP26	P15VISO Output	Analog	14 to 16 V	
TP22	TP35	-15 V Output	Analog	-14 to -16 V	
TP23	TP35	15 V Output	Analog	14.5 to 15.5 V	
TP24	TP35	5 V Output	Analog	4.75 to 5.25 V	
TP25	TP36	P15 V Output	Analog	14 to 16 V	
TP26	N/A	P0VISO Return	Analog		
TP27	TP35	Filament Output	Analog	0.75 to 1.25 V	During standby
TP35	N/A	Analog Ground	Analog		
TP36	N/A	P0V Return	Analog		

Converter Board - Connectors and Jumpers

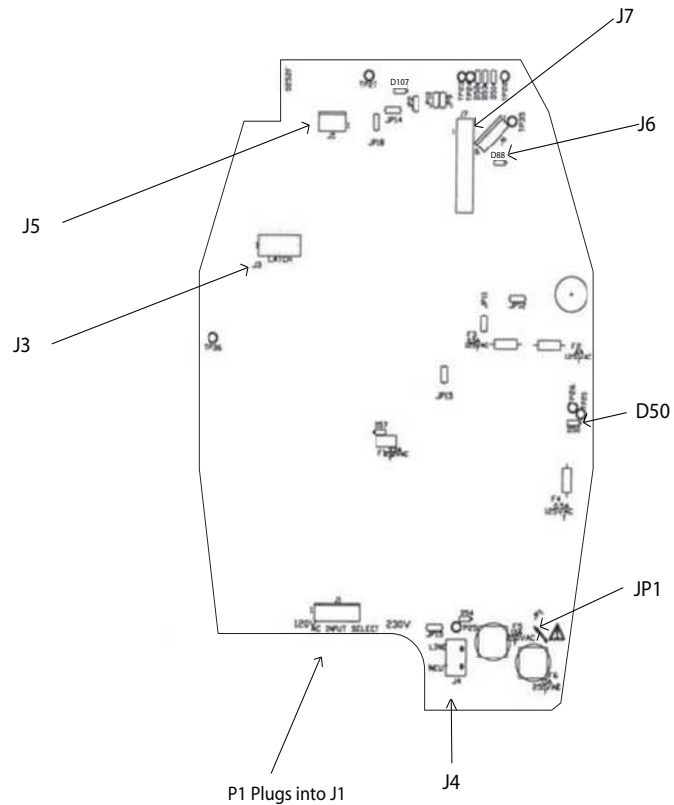


Figure 5-3 Location of Converter Board Connectors and Jumpers

(Continued)

(Continued)

Table 5-4 Converter Board (part no. 124-0292) Connectors

Connector	Description
J1	Line Voltage Configuration (P1 plugs into J1 for 120 or 230 V ac)
J3	HVDC Transformer Drive Output
J4	AC Input 120/230 V ac
J5	Filament Drive Output
J6	HV Feedback Input
J7	Control Board Interconnect
J8	Power Switch (not shown on page 5-12)

Table 5-5 Converter Board (part no. 124-0292) Jumpers

Jumper	Description
JP1	Neutral Fuse Jumper (must be present for hard-wired installations of 220 V)
P1	Line Voltage Configuration Jumper (Plugs into J1 for 120 or 230 V ac)

Logic Board - LEDs

Logic Board (part no. 124-0293)

Logic Board - LEDs

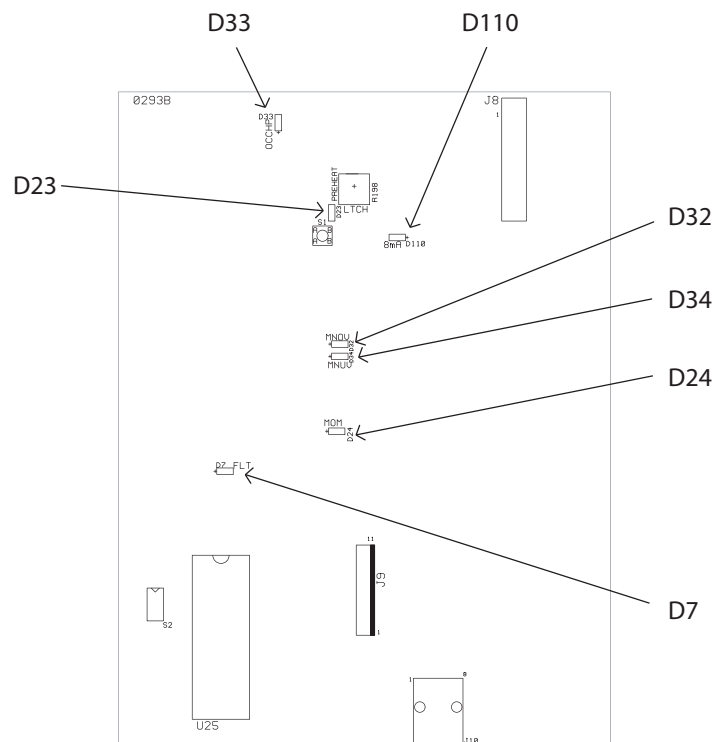


Figure 5-4 Location of Logic Board LEDs

(Continued)

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Table 5-6 Logic Board LEDs Description

Lamp Number	Color	Normal State	Error State	Explanation
D7	Red	Off	On	A fault has occurred
D23	Red	Off	On	A latched fault has occurred
D24	Red	Off	On	A momentary fault exists
D32	Red	Off	On	Mains overvoltage fault
D33	Red	Off	On	Overcurrent fault
D34	Red	Off	On	Mains undervoltage fault
D110	Green	Off	On	On mA feedback is over 8V Note: This is for factory use only

Logic Board - Test Points

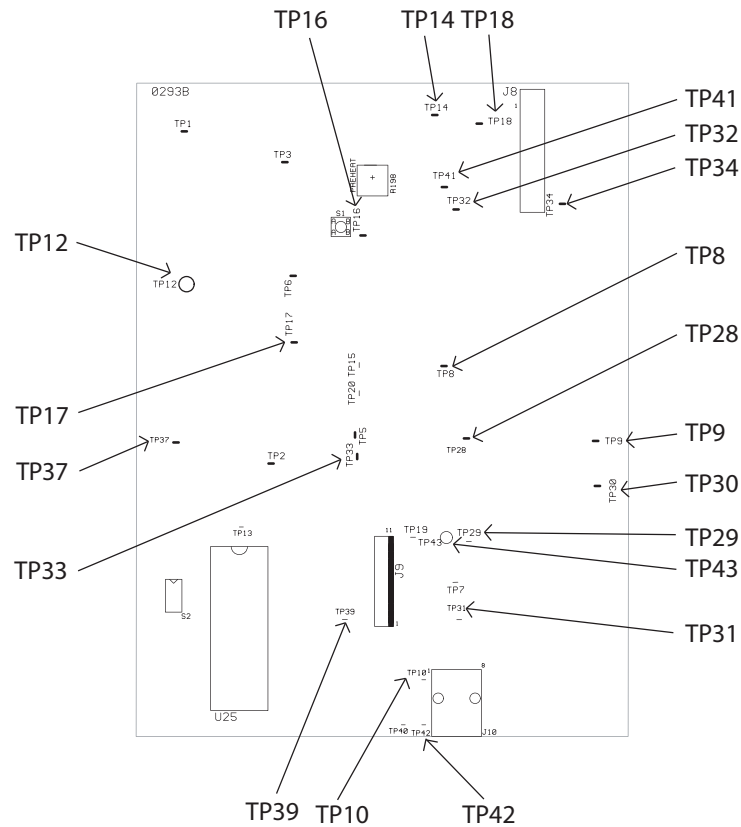


Figure 5-5 Location of Logic Board Test Points

(Continued)

(Continued)

Table 5-7 Logic Board Test Points Description

Test Point	Return	Description	Type	Nom. Range Values	Notes
TP8	TP37, 41 or 42	5V Reference	Analog	4.75 to 5.25 V	
TP9	TP37, 41 or 42	2.5V Reference	Analog	2.4 to 2.6 V	
TP10	TP37, 41 or 42	Exposure Switch	Digital	0 or 5 V	0 V during exposure switch closure
TP12	TP37, 41 or 42	X-ray On	Digital	0 or 5 V	5 V during exposure
TP14	TP37, 41 or 42	10V Reference	Analog	9.5 to 10.5 V	
TP16	TP37, 41 or 42	15V Output	Analog	14.5 to 15.5 V	Power supply
TP17	TP37, 41 or 42	5V Output	Analog	4.75 to 5.25 V	Power supply
TP18	TP37, 41 or 42	-15V Output	Analog	-14 to -16 V	
TP28	TP37, 41 or 42	Filament I sense	Analog	1.9 to 2.3 V	During standby; 2 V/ 1A
TP29	TP37, 41 or 42	Preheat I Command	Analog	-1.9 to -2.3 V	During standby
TP30	TP37, 41 or 42	mA Setpoint	Analog	6.7 to 7.3 V	
TP31	TP37, 41 or 42	mA Feedback	Analog	0 V	During exposure; 1 V/1 mA Note: There is no voltage at this test point unless an exposure is being made
TP32	TP37, 41 or 42	HV I Sense	Analog	0V	During standby; 1 V/2 A
TP33	TP37, 41 or 42	kV Feedback	Analog	0V	During exposure; 1 V/20 kV Note: There is no voltage at this test point unless an exposure is being made
TP34	TP37, 41 or 42	kV Setpoint	Analog	3.1 to 3.4 V	
TP37	NA	Analog Ground	Analog	NA	
TP39	TP40	5V Digital	Analog	4.75 to 5.25 V	Power Supply
TP41	NA	Analog Ground	Analog	NA	
TP42	NA	Analog Ground	Analog	NA	
TP43	TP37, 41 or 42	X-ray Indicate	Digital	0 or 5 V	5 V during exposure

Logic Board - Connectors and Jumpers

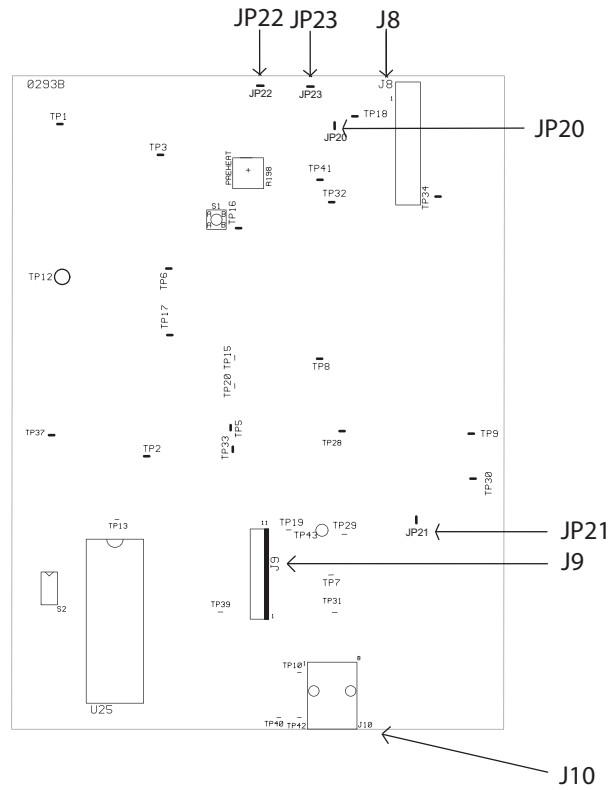


Figure 5-6 Location of Logic Board Connectors and Jumpers

(Continued)

(Continued)

Table 5-8 Logic Board (part no. 124-0293) Connectors

Designator	Description
J8	Converter Board Interconnect
J9	Tubehead Interface PCB
J10	Interface Assembly (Master Control Touch Panel serial bus)

Table 5-9 Logic Board (part no. 124-0293) Jumpers

Designator	Description
JP20	Negative Preheat Offset (must be open for normal operation)
JP21	mA Feedback Loop (must be present for normal operation)
JP22	Positive Preheat Offset (must be open for normal operation)
JP23	Jumper Holder

Electrical Block Diagram

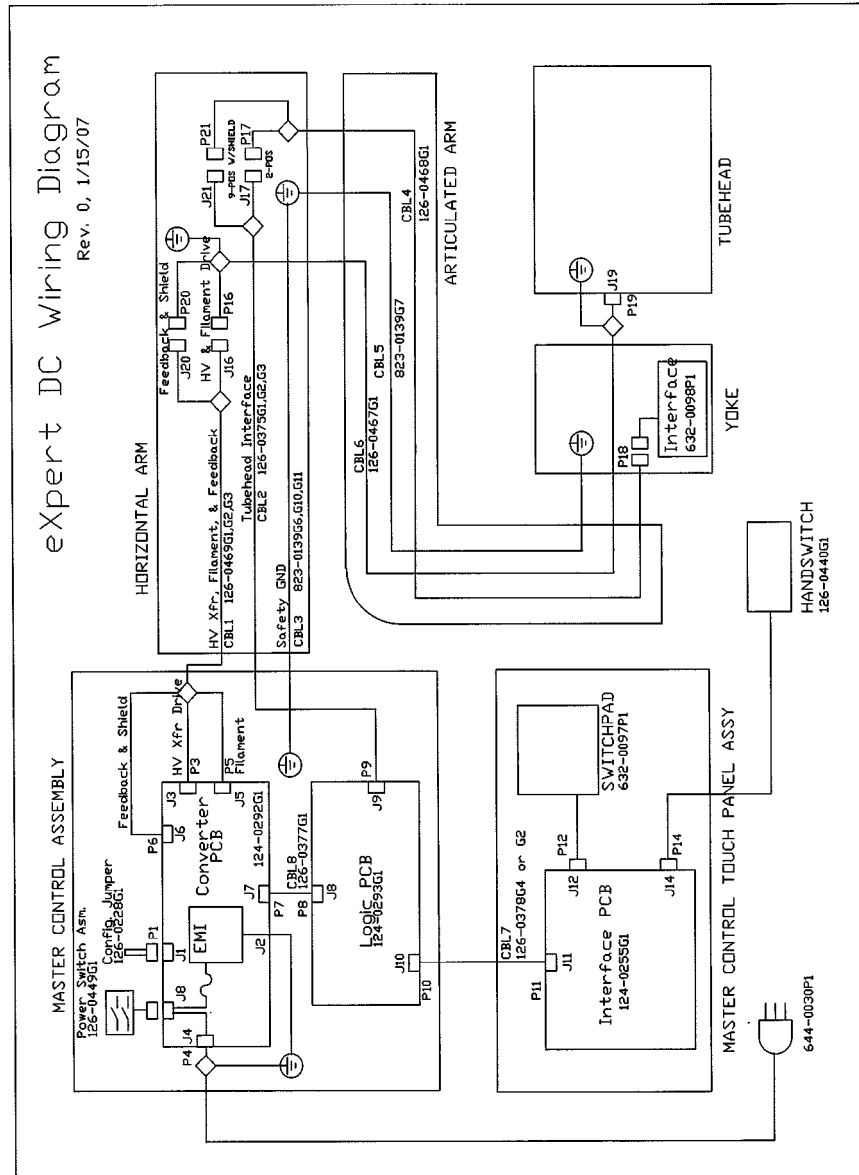


Figure 5-7 Electrical Block Diagram

6- Replacement Parts



WARNING

Before starting any procedure, review the safety information provided in the Gendex expert® DC User Manual.



Figure 6-1 Gendex expert® DC Assemblies

Assemblies

Articulated Arm and Tubehead

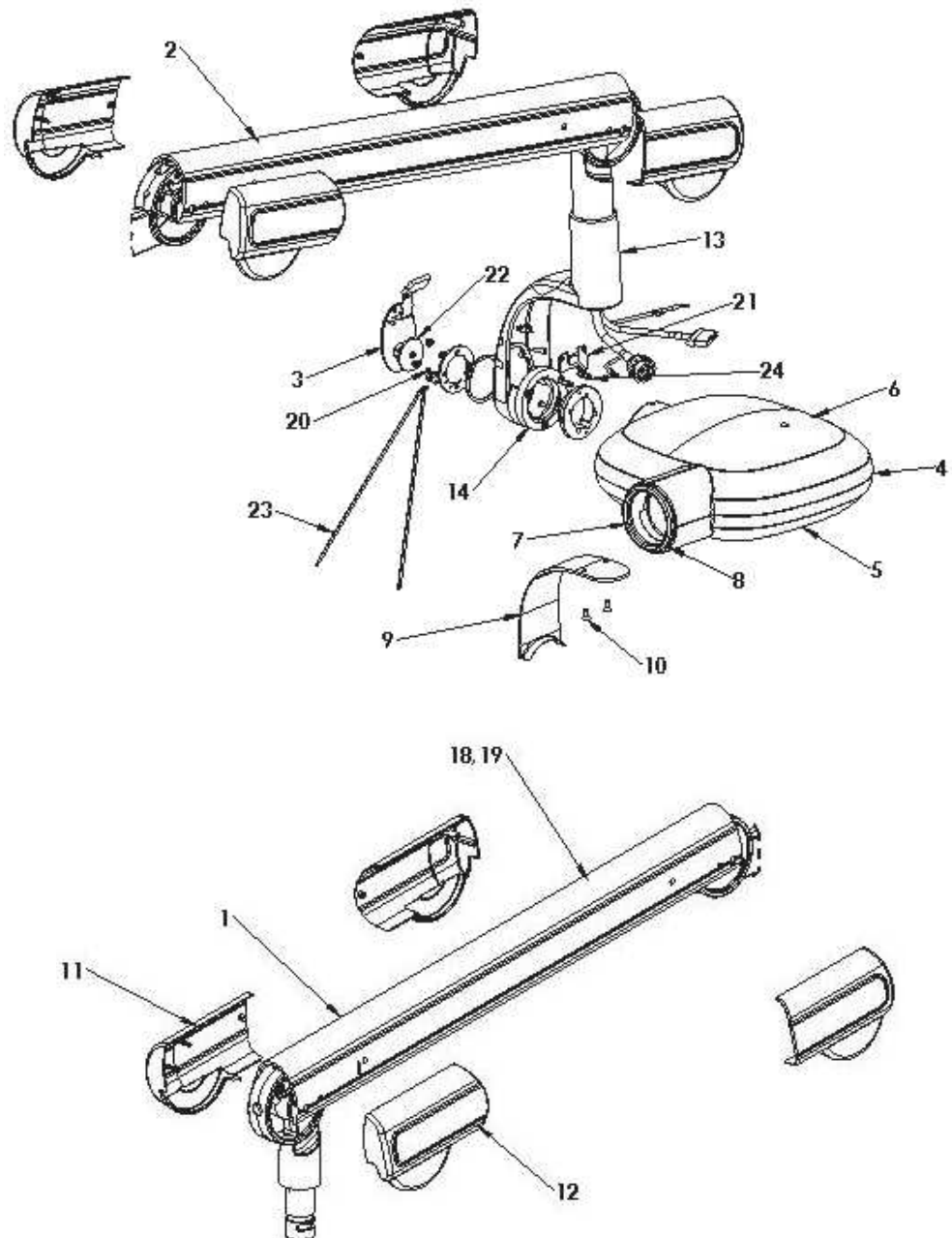


Figure 6-2 Articulated Arm and Tubehead Diagram

Table 6-1 Articulated Arm and Tubehead Part Description

Item	Part No.	Description
1	112-1194G1	Assy, Articulated Arm Converter Side
2	112-1197G1	Assy, Articulated Arm, Tube Side
3	112-1198G1	Assy, Keypad Yoke, Expert
4	110-0209G1	Assy, Tube Head, Final, Expert (includes top and bottom cover)
5	303-0135P1	Cover, Tube Head, Bottom, Expert
6	303-0134P1	Cover, Tube Head, Top, Expert
7	D720C	Cone Assy, 8" (20 cm) Focal Length
8	404-0006P11	Cone O-Ring
9	300-0030P4	Cover, Yoke, Silk Screened
10	05-00-040010-01	Screw, M4x.7x10 mmLG.
11	303-0127P1	Cap, End, Arm, Male x 4
12	303-0128P1	Cap, End, Arm, Female x 4
13	112-0941G1	Yoke Assy
14	241-0025P1	Plate, Yoke
NS	D730C	Cone Assy, 12" (30 cm) Focal Length
NS	D720RC	Rectangular Cone, 8" (20 cm) Focal Length
NS	D730RC	Rectangular Cone, 12" (30 cm) Focal Length
18	110-0204G1	Assy, Scissors Arm and Tubehead
19	112-1194G1	Assy, Scissors Arm without Tubehead
20	203-0393	Bracket, lower
21	210-0321	Bracket, upper
22	214-0160	Friction plate
23	46208758P9	Cable ties
24	642-0152	Nut, Yoke Keyboard Base
NS = Not Shown		

Horizontal Arm

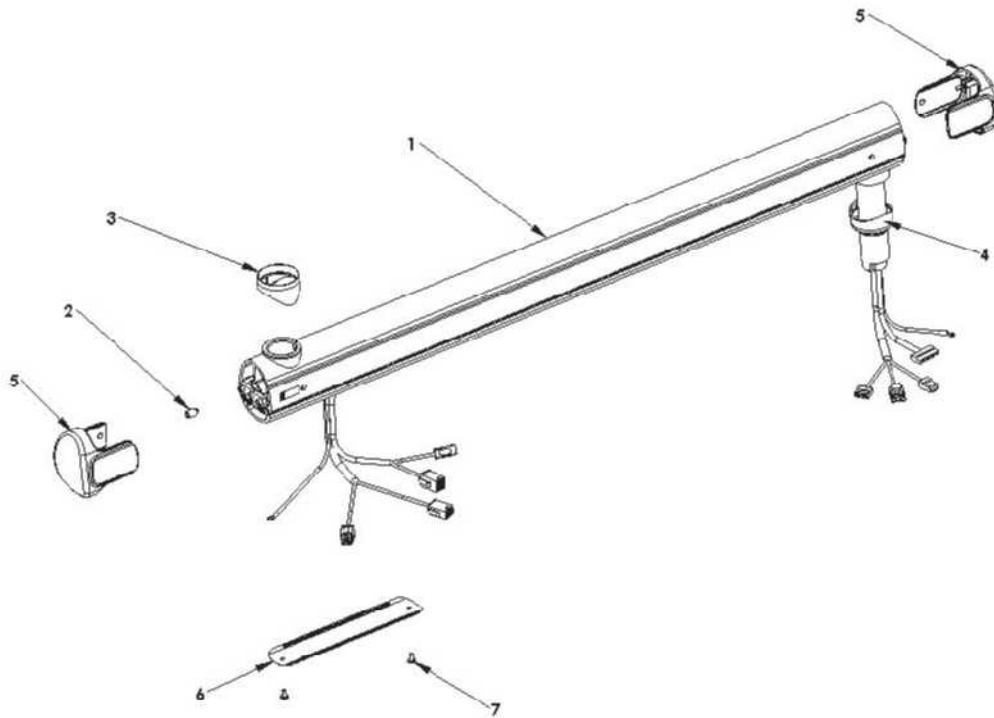


Figure 6-3 Horizontal Arm Diagram

Table 6-2 Horizontal Arm Description

Item	Part No.	Description
1	112-1193G1	Assy, Horizontal Arm, Expert, 75" (191cm) reach
	112-1193G2	Assy, Horizontal Arm, Expert, 65" (165cm) reach
	112-1193G3	Assy, Horizontal Arm, Expert, 55" (140cm) reach
2	09-06-080012-05	Nylon Tipped Set Screw
3	303-0125P1	Joint Arm Cover, Articulated Arm Side
4	303-0124P1	Joint Arm Cover, Converter Side
5	303-0126P1	Cap, End, Horizontal Arm
6	303-0106P2	Cover Wire Access
7	08-10-040008-01	Screw, M4 x 8, PPHDMS

Master Control

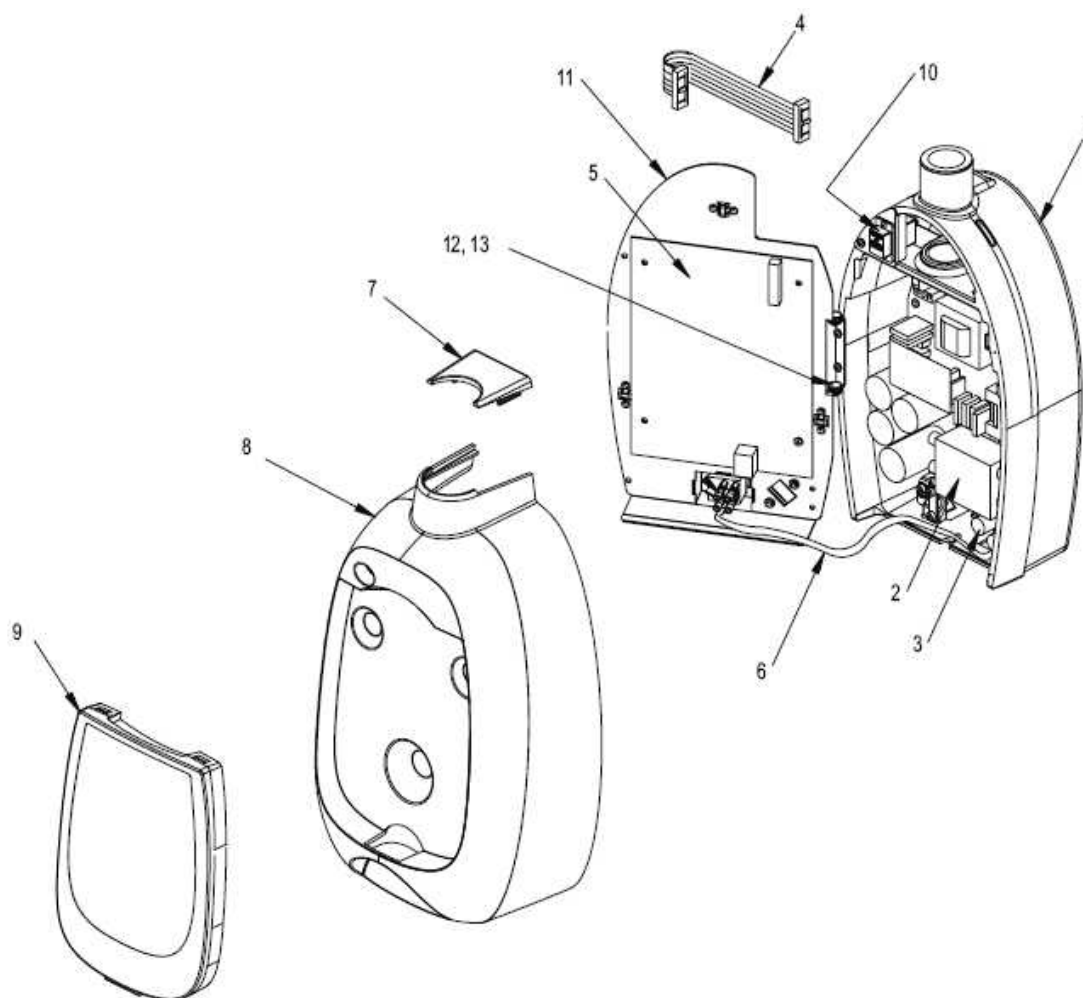


Figure 6-4 Master Control Diagram

Table 6-3 Master Control Parts Description

Item	Part No.	Description
1	112-0991G1	Assy, Converter with Bearings
2	124-0292G1	Assy, PCB, Converter
3	46-170021P53	Fuse, 10A
4	126-0377G1	Assy, Cable, CPU to Power
5	124-0293G1	Assy, PCB, Control & CPU

(Table continued on the next page)

Table 6-3 Master Control Parts Description (Continued)

Item	Part No.	Description
6	126-0449G1	Assy, Power Switch & Cable, 20A, 250VAC
7	303-0132P1	Cover, Top, Main, Expert
8	112-1206G1	Assy, Cover, Outer, Main, Expert
9	303-0133P2	Cover, Remote Filler, Expert
10	112-1191G1	Assy, USB Connector, Wall Mount
11	112-1205G1	Assy, Door, Wall Mount
12	427-0027P4	Push Retainer
13	230-0225P2	Hinge Pin, Door, Wall Mount

Master Control Touch Panel

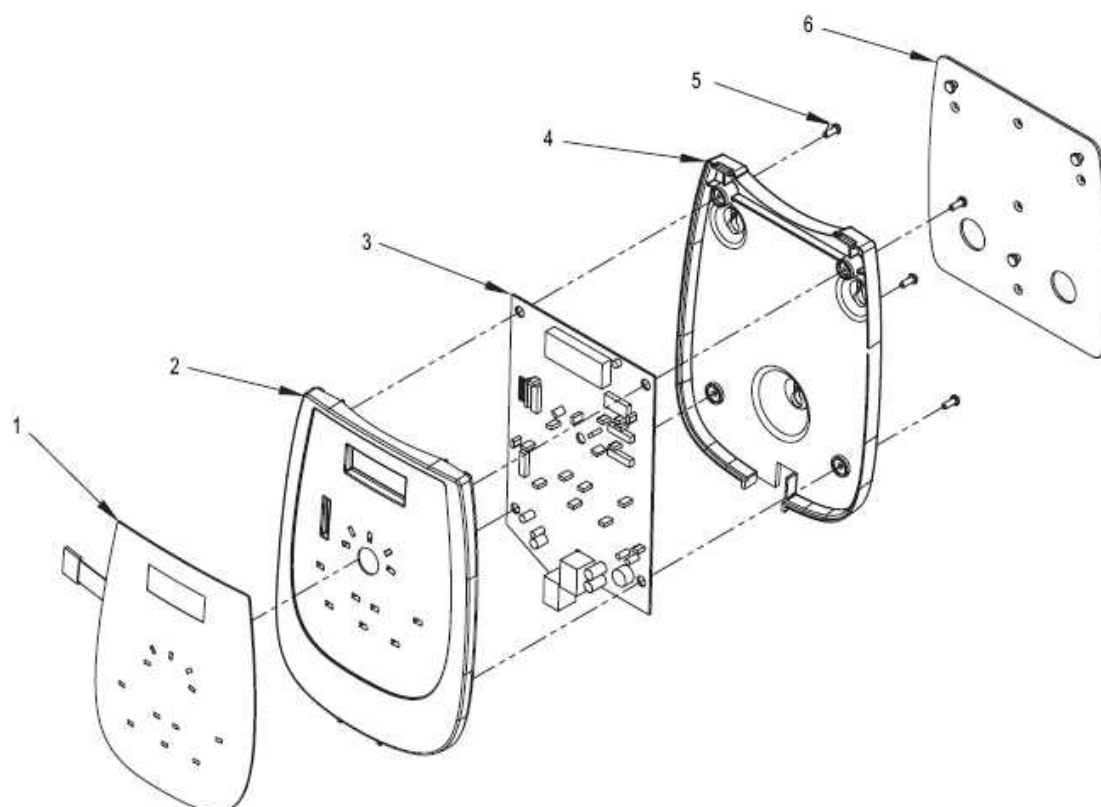


Figure 6-5 Master Control Touch Panel Diagram

Table 6-4 Master Control Touch Panel

Item	Part No.	Description
1	632-0097P1	Keypad, Remote, Expert
2	303-0129P2	Cover, Remote, Front, Expert
3	124-0255G1	Assy, Interface P.C.B.
4	303-0130P1	Cover, Remote, Rear, Expert
5	422-0098P2	Screw, Phil Pan HD, HI-LO, #6x3/8 x4
6	114-0458G1	Weldment, Plate, Remote Mounting
NS	427-0196P4	Screw, 8x2-1/2, Drywall x 3 or x 6
NS	112-1167G2	Assy, Remote Switch Mounting Screws



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